ita
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PROGRAM OUTLINE

Automotive Glass Technician

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AUTOMOTIVE GLASS TECHNICIAN

PROGRAM OUTLINE

2009

Developed By
Industry Training Authority
Province of British Columbia

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FOREWORD

The revised Glass Technician Program Outline is intended as a guide for instructors, apprentices, and employers of apprentices, as well as for the use of industry organizations, regulatory bodies, and provincial and federal governments. It reflects updated standards based on the National Occupational Analysis for Glass Technician and British Columbia industry and instructor subject matter experts.

Practical instruction by demonstration and student participation should be integrated with classroom sessions. Safe working practices, even though not always specified in each operation or topic, are implied part of the program and should be stressed throughout the apprenticeship.

The Program Outline was prepared with the advice and assistance of the Industry Steering Committee and will form the basis for further updates of the British Columbia Glass Technician Program and creation of the learning resources by the Automotive Training Standards Organization on behalf of the Industry Training Authority.

Each competency is to be evaluated through the use of written and/or a practical assessment in which the learner must achieve a minimum of 70% in order to receive a passing grade for that competency. The types of questions used on these exams must reflect the cognitive level indicated by the learning objectives and the learning tasks listed in the related competencies.

Achievement Criteria are included for those competencies that require a practical component. The intent of including Achievement Criteria in this Program Outline is to ensure consistency in the training across the many training institutes in British Columbia. Their purpose is to reinforce the theory and to provide a mechanism for evaluation of the learner's ability to apply the theory to practice. It is important that these performances be observable and measureable and that they reflect the skills spelled out in the competency as those required of a competent journeyperson. The conditions under which these performances will be observed and measured must be clear to the learner as well as the criteria by which the learner will be evaluated. The expectation for success must also be outlined for the learner.

The performance spelled out in the Achievement Criteria is suggested performance and is not meant to stifle flexibility of delivery. Training providers are welcome to substitute other practical performances that measure similar skills and attainment of the competency. Multiple performances may also be used to replace individual performances where appropriate.

Evaluation

At the completion of technical training each apprentice will complete an evaluation examination based on that year's work. The apprentice must achieve a minimum of 70% to receive certification.

SAFETY ADVISORY
Be advised that references to the WorkSafe BC safety regulations contained within these materials do not/may not reflect the most recent Occupational Health and Safety Regulation (the current Standards and Regulation in BC can be obtained on the following website: http://www.worksafebc.com. Please note that it is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety Regulation pertaining to his/her work.

ACKNOWLEDGEMENTS

The Program Outline was prepared with the advice and direction of an industry steering committee convened initially by the Automotive Training Standards Organization.

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SECTION 1

AUTOMOTIVE GLASS TECHNICIAN OCCUPATIONAL ANALYSIS CHART

Automotive Glass Technician
Occupational Analysis Chart

Safety, Care and Use of Automotive Glass Tools **Line A**	Identify personal protective equipment and safety A-1	Identify specialty tools A-2	Explain when specialty tools are required A-3	Explain the safe use of specialty tools A-4
Vehicle Protection **Line B**	Identify protective equipment and procedures B-1	Explain protective equipment B-2	Identify vehicle paint B-3	
Damage Assessment **Line C**	Explain damage assessment C-1	Introduce specialty glass features and applications C-2		
Removal Procedures **Line D**	Explain pre inspection procedure D-1	Explain hardware and trim D-2	Explain hardware and trim removal D-3	Explain windshield removal procedures D-4	Explain removal procedures for back glass D-5	Explain removal procedures for side glass D-6
Installation procedures **Line E**	Explain windshield installation E-1	Explain side glass installation E-2	Explain back glass installation E-3	Describe hardware and trim installation E-4	Explain glass specialty installation procedures E-5	

Automotive Glass Technician
Occupational Analysis Chart

Supplemental Restraint System **Line F**	Explain airbag systems F-1				
	1				
Windshield Repair **Line G**	Explain windshield repair methods G-1	Discuss windshield repair equipment G-2			
	1	1			
Template Preparation **Line H**	Discuss template procedures for laminated glass H-1	Discuss template procedures for tempered glass H-2	Discuss template procedures for automotive mirrors H-3		
	1	1	1		
Troubleshooting Procedures **Line I**	Explain troubleshooting, power and heated laminated glass I-1	Explain diagnosing and repairing water leaks I-2			
	1	1			

SECTION 2

AUTOMOTIVE GLASS TECHNICIAN PROGRAM OUTLINE

SUGGESTED SCHEDULE OF TIME ALLOTMENT FOR AUTOMOTIVE GLASS TECHNICIAN

Level 1			Theory Hours	Practical Hours
Line A	**Safety, Care and Use of Automotive Glass Tools**	**5% of Time**		
A-1	Identify personal protective equipment		✓	✓
A-2	Identify specialty tools		✓	
A-3	Explain when specialty tools are required		✓	
A-4	Demonstrate the safe use of specialty tools			✓
Line B	**Vehicle Protection**	**5% of Time**		
B-1	Identify protective equipment and procedures		✓	
B-2	Explain protective equipment		✓	
B-3	Identify vehicle paint conditions		✓	✓
Line C	**Damage Assessment**	**2% of Time**		
C-1	Explain damage assessment procedures		✓	
C-2	Introduce specialty glass features and applications		✓	
Line D	**Removal Procedures**	**25% of Time**		
D-1	Explain pre inspection procedure		✓	✓
D-2	Explain hardware and trim		✓	
D-3	Explain hardware and trim removal		✓	✓
D-4	Explain windshield removal procedures		✓	✓
D-5	Explain removal procedures for back glass		✓	✓
D-6	Explain removal procedures for side glass		✓	✓
Line E	**Installation Procedures**	**25% of Time**		
E-1	Explain windshield installation		✓	✓
E-2	Explain side glass installation		✓	✓
E-3	Explain back glass installation		✓	✓
E-4	Describe hardware and trim installation		✓	
E-5	Explain specialty glass installation procedures		✓	
Line F	**Supplemental Restraint System**	**3% of Time**		
F-1	Explain airbag systems		✓	
Line G	**Windshield Repair**	**10% of Time**		
G-1	Explain windshield repair methods		✓	
G-2	Discuss windshield repair equipment		✓	

Line H	**Template Preparation**	**10% of Time**		
H-1	Discuss template procedures for laminated glass		✓	✓
H-2	Discuss template procedures for tempered glass		✓	✓
H-3	Discuss template procedures for automotive mirrors		✓	✓

Line I	**Troubleshooting Procedures**	**15% of Time**		
I-1	Explain troubleshooting, power and heated laminated glass		✓	✓
I-2	Explain diagnosing and repairing water leaks		✓	✓

AUTOMOTIVE GLASS TECHNICIAN PROGRAM OUTLINE

Line A: **SAFETY, CARE AND USE OF AUTOMOTIVE GLASS TOOLS**
Competency: **A-1 Identify personal protective equipment**

Learning Objectives:
1. The learner will be able to identify Personal Protective Equipment (PPE).
2. The learner will be able to describe the maintenance and care for specialty tools.

LEARNING TASKS	CONTENT
1. Identify Personal Protective Equipment (PPE).	• Safety glasses • Steel toed boots • Ear protection • Respirator • MSDS • WHMIS • Protective gloves • Coveralls
2. Describe the maintenance and care for specialty tools.	• Cleaning, maintenance & sharpening of hand tool • Electrical connections • Extension cords • Tool inventory • Storage • Oiling

Achievement Criteria:
Given a 10 question quiz on personal protective equipment, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line A: **SAFETY, CARE AND USE OF AUTOMOTIVE GLASS TOOLS**
Competency: **A-2 Identify specialty tools**

Learning Objectives:
1. The learner will be able to identify specialty tools.
2. The learner will be able to describe the maintenance and care for specialty tools.

LEARNING TASKS	CONTENT
1. Identify specialty tools.	• Pneumatic Feine™ cutaway knife • Pneumatic applicator for urethane • Extractor • 2-part urethane applicator gun (info only) • Calking gun (cradle or barrel) • Piano wire • Cut out knife (cold knife, oscillating, reciprocating) • Misc. specialty tools i.e. wiper arm puller • Rear view mirror tools, trim tools
2. Describe the maintenance and care for specialty tools.	• Cleaning, maintenance & sharpening of hand tool • Electrical connections • Extension cords • Tool inventory • Storage • Oiling

Achievement Criteria:
Given a 10 question quiz on identifying specialty tools, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line A: **SAFETY, CARE AND USE OF AUTOMOTIVE GLASS TOOLS**
Competency: **A-3 Explain when specialty tools are required**

Learning Objectives:

1. The learner will be able to identify vehicles with special requirements.
2. The learner will be able to explain when specialty tools are required.

LEARNING TASKS	CONTENT
1. Identify vehicle with special requirements.	• Encapsulated glass • Dash design • Damaged automotive glass • Misc. special requirements – i.e. offset urethane, bead to glass edge, inside/outside extraction
2. Explain when specialty tools are required for working on vehicles with collision damage.	• Outer body panels • Access problems • Misc. collision damage

Achievement Criteria:
Given a 10 question quiz on identifying specialty tools, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line A: **SAFETY, CARE AND USE OF AUTOMOTIVE GLASS TOOLS**
Competency: **A-4 Explain the safe use of specialty tools**

Learning Objectives:

1. The learner will be able to demonstrate the operation of pneumatic tools.
2. The learner will be able to demonstrate the use of electric tools.
3. The learner will be able to demonstrate the use of hand tools.

LEARNING TASKS	CONTENT
1. Demonstrate the operation of pneumatic tools.	• Power supply, regulating pressure • Pneumatic applicator for urethane (info use only) • 2-part urethane applicator gun (info use only) • Misc. pneumatic tools i.e. Riveter
2. Demonstrate the use of electric tools.	• Power supply • Heat gun • Jig saw • Electric drill • Hot knife • Extractor • Miscellaneous electric tools
3. Demonstrate the use of hand tools.	• Piano wire • Hook tool • Miscellaneous hand tools • Cut out knife (cold knife)

Achievement Criteria:
Given a 10 question quiz on demonstrating the safe use of specialty tools, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line B: **VEHICLE PROTECTION**
Competency: **B-1 Identify protective equipment and procedures**

Learning Objectives:
1. The learner will be able to identify protective equipment.
2. The learner will be able to explain the use of protective equipment.

LEARNING TASKS	CONTENT
1. Identify the different types of protective equipment.	• Fender covers • Hood covers • Seat covers • Dash covers • Protective tape • Temporary weather barrier
2. Explain the reasons for using protective equipment.	• Glass particles • Stains • Damage • Protect paint • Coveralls

Achievement Criteria:
Given a 10 question quiz on identifying protective equipment and procedures, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line B: **VEHICLE PROTECTION**
Competency: **B-2 Explain protective equipment**

Learning Objectives:

1. The learner will be able to explain the various ways of protecting a vehicle.

LEARNING TASKS	CONTENT
1. Explain how to use various types of vehicle protective equipment.	• Miscellaneous vehicle protective covers – Dash covers – Fender covers – Seat covers – Floor mats – Temporary weather barrier • Tape – Masking tape – Duct tape

Achievement Criteria:

Given a 10 question quiz on the use of protective equipment, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line B: **VEHICLE PROTECTION**
Competency: **B-3 Identify vehicle paint conditions**

Learning Objectives:
1. The learner will be able to identify the condition of the vehicle surface.
2. The learner will be able to discuss types of paint problems.

LEARNING TASKS	CONTENT
1. Identify surface conditions.	• Visual inspection • Masking tape • Thinners • Sanding • Corrosion/rust
2. Discuss types of paint problems.	• Peeling • Poor prep • Old damage • New damage • Rust/corrosion • Checking • Blistering • Fisheyes • Bleed through • Bridging • Sand scratches • Swelling • Discoloration • Tiger striping • Modeling • Sags • Runs • Chalking • Blushing

Achievement Criteria:
Given a 10 question quiz on identifying condition of paint, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line C: **DAMAGE ASSESSMENT**
Competency: **C-1 Explain damage assessment**

Learning Objectives:

1. The learner will be able to explain damage related to auto glass.
2. The learner will be able to assess previous damage.

LEARNING TASKS	CONTENT
1. Discuss damage related to glass replacement.	• Determine parts required • Determine specific materials required
2. Explain previous damage assessment.	• Inspect vehicle thoroughly • Fill out damage inspection report • Report suspected previous damage to supervisor

Achievement Criteria:

Given a 10 question quiz on damage assessment, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line C: **DAMAGE ASSESSMENT**
Competency: **C-2 Introduce specialty glass features and applications**

Learning Objectives:
1. The learner will be able to explain specialty glass removal procedures.

LEARNING TASKS	CONTENT
1. Explain removal procedures for vehicles with unique removal requirements.	• Air bags • Multiple airbags • Sun roofs • Collision damage • Partial removal of vinyl roof • List of specialty vehicles • Special precautions • Heads-up display • Rain sensors • Night vision • Heated windshields • Solar sunroofs

Achievement Criteria:
Given a 10 question quiz on introduction to specialty glass features and applications the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line D: **REMOVAL PROCEDURES**
Competency: **D-1 Explain pre-inspection procedure**

Learning Objectives:

1. The learner will be able to explain the process of a pre-inspection procedures.
2. The learner will be able to discuss previous damage assessment.

LEARNING TASKS	CONTENT
1. Explain the process of a pre inspection procedure.	• Identify colour, tint, shade, frit • HUD (heads up display) • Rain/moisture sensor • Heated windshield • Acoustic inner layer • Electronic mirror • Identifying NAGS
2. Discuss previous damage assessment.	• Inspect vehicle thoroughly • Fill out damage inspection report • Report suspected previous damage to Supervisor

Achievement Criteria:
Given a 10 question quiz on the process of a pre-inspection procedure, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line D: **REMOVAL PROCEDURES**
Competency: **D-2 Explain hardware and trim**

Learning Objectives:

1. The learner will be able to explain the functions of hardware and trim.
2. The learner will be able to describe the characteristics of automotive fasteners as related to auto glass.

LEARNING TASKS	CONTENT
1. Explain function of hardware and trim.	• Encapsulated • Reveal • Garnish • Windshield wipers • Weather-strip • Cowl panel
2. Describe the characteristics of automotive fasteners as related to auto glass.	• Windshield molding clips • Sheet metal screws • Allen head • Nylon fasteners • Misc. fasteners

Achievement Criteria:
Given a 10 question quiz on function of hardware and trim, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line D: **REMOVAL PROCEDURES**
Competency: **D-3 Explain hardware and trim removal**

Learning Objectives:
1. The learner will be able to explain trim removal procedures.
2. The learner will be able to explain hardware removal procedures.

LEARNING TASKS	CONTENT
1. Explain trim removal procedures.	• Determine whether part is removable • Select proper tools • Weather-stripping • Encapsulated • Reveal • Garnish • Cowl panel
2. Explain hardware removal procedures.	• Electrical connections • Clip removal • Location of fasteners • Rear view mirror • Mounting button • Windshield wipers • Windshield washers

Achievement Criteria:
Given a 10 question quiz on removal procedures for hardware and trim, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line D: **REMOVAL PROCEDURES**
Competency: **D-4 Explain windshield removal procedures**

Learning Objectives:

1. The learner will be able to explain windshield removal procedures.
2. The learner will be able to explain removal procedures.

LEARNING TASKS	CONTENT
1. Identify types of windshield removal procedures.	• Gasket • Thiokol/butyl • Urethane
2. Explain windshield removal procedures.	• Gasket type • Thiokol/butyl type • Urethane type • Cleaning vehicle

Achievement Criteria:
Given a 10 question quiz on windshield removal procedures, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line D: **REMOVAL PROCEDURES**
Competency: **D-5 Explain removal procedures for back glass**

Learning Objectives:

1. The learner will be able to identify types of back glass removal procedures.
2. The learner will be able to explain back glass removal procedures.

LEARNING TASKS	CONTENT
1. Identify types of back glass removal procedures.	• Gasket • Thiokol/butyl • Urethane
2. Explain back glass removal procedures.	• Gasket type • Thiokol/butyl type • Urethane type • Cleaning vehicle

Achievement Criteria:
Given a 10 question quiz on back glass removal procedures, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line D: **REMOVAL PROCEDURES**
Competency: **D-6 Explain removal procedures for side glass**

Learning Objectives:

1. The learner will be able to identify types of side glass removal procedures.
2. The learner will be able to explain side glass removal procedures.

LEARNING TASKS	CONTENT
1. Identify types of side glass removal procedures.	• Gasket type • Movable glass • Bonded glass
2. Explain side glass removal procedures.	• Gasket type • Movable glass • Bonded glass

Achievement Criteria:
Given a 10 question quiz on side glass removal procedures, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line E: **INSTALLATION PROCEDURES**
Competency: **E-1 Explain windshield installation**

Learning Objectives:
1. The learner will be able to identify types of windshield installation procedures.
2. The learner will be able to explain windshield installation procedures.

LEARNING TASKS	CONTENT
1. Identify types of windshield installation procedures.	• Gasket • Thiokol/butyl • Urethane
2. Explain windshield installation procedures.	• Cleaning and preparation • Gasket type • Thiokol/butyl type • Urethane type • Install mouldings (if required) • Cleaning vehicle

Achievement Criteria:
Given a 10 question quiz on windshield installation procedures, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line E: **INSTALLATION PROCEDURES**
Competency: **E-2 Explain side glass installation**

Learning Objectives:
1. The learner will be able to identify types of side glass installation procedures.
2. The learner will be able to explain side glass installation procedures.

LEARNING TASKS	CONTENT
1. Identify types of side glass installation procedures.	• Gasket • Movable glass • Bolt-in/foam core • Bonded glass
2. Explain side glass installation procedures.	• Cleaning and preparation • Gasket type • Bonded • Movable glass • Installation of mouldings, hardware and • Attachments • Cleaning vehicle • Bolt in/foam core

Achievement Criteria:
Given a 10 question quiz on side glass installation procedures, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line E: **INSTALLATION PROCEDURES**
Competency: **E-3 Explain back glass installation**

Learning Objectives:

1. The learner will be able to Identify types of back glass installation procedures.
2. The learner will be able to explain back glass installation procedures.

LEARNING TASKS	CONTENT
1. Identify types of back glass installation procedures.	• Gasket • Thiokol/butyl • Urethane
2. Explain back glass installation procedures.	• Cleaning and preparation • Gasket type • Thiokol/butyl type • Urethane type • Install mouldings (if required) • Cleaning vehicle • Bolt in/foam core

Achievement Criteria:
Given a 10 question quiz on back glass installation procedures, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line E: **INSTALLATION PROCEDURES**
Competency: **E-4 Explain hardware and trim installation**

Learning Objectives:

1. The learner will be able to describe installation procedures for hardware and trim.

LEARNING TASKS	CONTENT
1. Describe installation procedures for hardware and trim.	• Identify various hardware and trim • Weatherstriping • Fasteners

Achievement Criteria:

Given a 10 question quiz on installation procedures for hardware and trim, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line E: **INSTALLATION PROCEDURES**
Competency: **E-5 Explain specialty glass installation procedures**

Learning Objectives:
1. The learner will be able to explain advanced specialty glass installation procedures.

LEARNING TASKS	CONTENT
1. Explain specialty glass installation procedures.	• PAAS preparation • PVC bonding • Primers • Corrosion • Structural integrity • Cold weather requirements • Krytox application • Modular parts/m-seal • Encapsulated parts • Rain sensor kits • Mouldings/clips/attachments to be applied to glass prior to installation • Conductive urethane procedures • Non-conductive urethane procedures • Temperature/humidity

Achievement Criteria:
Given a 10 question quiz on advanced specialty glass installation procedures the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line F: **SUPPLEMENTAL RESTRAINT SYSTEM**
Competency: **F-1 Explain airbag systems**

Learning Objectives:

1. The learner will be able to identify various types of supplemental restraint systems.
2. The learner will be able to identify precautionary measures for handling airbag systems.

LEARNING TASKS	CONTENT
1. Identify various types of supplemental restraint systems.	• Driver side airbag • Passenger side airbag • Side impact airbag (curtains) • Explain multiple airbag systems
2. Identify and explain precautionary measures when handling airbag systems.	• Identify vehicles equipped with side airbags • Explain precautionary measures • Handling procedures • Safety equipment • Disposal

Achievement Criteria:

Given a 10 question quiz on various types of airbags and identifying precautionary measures for safe handling, the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line G: **WINDSHIELD REPAIR**
Competency: **G-1 Explain windshield repair methods**

Learning Objectives:
1. The learner will be able to explain windshield repair methods.
2. The learner will be able to determine the appropriate repair system for different types of glass damage.

LEARNING TASKS	CONTENT
1. Explain how to repair various types of damage.	• Crack repair techniques • Multiple damage repair • Edge crack repair techniques • Scratch removal techniques • Stars • Bull's-eyes
2. Determine the appropriate repair system for different types of glass damage.	• Bridge types • Ultra violet lamps • Vacuum pump • Polishing • Misc. equipment

Achievement Criteria:
Given a 10 question quiz on windshield repair methods the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line G: **WINDSHIELD REPAIR**
Competency: **G-2 Discuss windshield repair equipment**

Learning Objectives:
1. The learner will be able to discuss windshield repair equipment.
2. The learner will be able to discuss the characteristics of the various glass repair resins.

LEARNING TASKS	CONTENT
1. Discuss types of repair equipment.	• Bridge types • Ultra violet lamps • Vacuum pump • Polisher
2. Discuss the characteristics of the various glass repair resins.	• Break resin • Crack resin • Pit filler • Jewellers rouge

Achievement Criteria:
Given a 10 question quiz on windshield repair equipment used and the various resins available the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line H: **TEMPLATE PREPARATION**
Competency: **H-1 Discuss template procedures for laminated glass**

Learning Objectives:
1. The learner will be able to discuss measurements and calculation procedures.
2. The learner will be able to discuss tracing of opening.
3. The learner will be able to discuss use of existing laminated glass as pattern.
4. The learner will be able to fabricate part for installation.

LEARNING TASKS	CONTENT
1. Discuss measurements and calculation procedures.	• Basic mathematical skill requirements • Use of measuring devices • Demonstrate proper measurement techniques • Determine size allowance for supporting Rubber mouldings
2. Discuss tracing of opening.	• Calculate glazing size • Identify glazing material requirements • Template material
3. Discuss use of existing laminated glass as pattern.	• Fit of existing glass • Calculate glazing size • Identify glazing material requirements
4. Fabricate part for installation.	• Cut glass • Glass finishing/edging • Safe handling and use of methyl hydrate • Lighter

Achievement Criteria:
Given a 10 question quiz on template preparation procedures for laminated glass the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line H: **TEMPLATE PREPARATION**
Competency: **H-2 Discuss template procedures for tempered glass**

Learning Objectives:
1. The learner will be able to discuss measurements and calculation procedures.
2. The learner will be able to discuss tracing of opening.
3. The learner will be able to discuss use of existing tempered glass as pattern.
4. The learner will be able to fabricate part for installation.

LEARNING TASKS	CONTENT
1. Discuss measurements and calculation procedures.	• Basic mathematical skill requirements • Use of measuring devices • Demonstrate proper measurement techniques • Determine size allowance for supporting rubber moldings
2. Discuss tracing of opening.	• Calculate glazing size • Identify glazing material requirements • Template material
3. Discuss use of existing tempered glass as pattern.	• Fit of existing glass • Calculate glazing size • Identify glazing material requirements
4. Fabricate part for installation.	• Cut glass • Glass finishing/edging • Sublet for tempering

Achievement Criteria:
Given a 10 question quiz on template preparation procedures for tempered glass the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line H: **TEMPLATE PREPARATION**
Competency: **H-3 Discuss template procedures for automotive mirrors**

Learning Objectives:
1. The learner will be able to discuss measurements and calculation procedures.
2. The learner will be able to discuss tracing of opening.
3. The learner will be able to discuss use of existing mirror as pattern.
4. The learner will be able to fabricate part for installation.

LEARNING TASKS	CONTENT
1. Discuss measurements and calculation procedures.	• Basic mathematical skill requirements • Use of measuring devices • Demonstrate proper measurement techniques • Determine size allowance for supporting Rubber moldings
2. Discuss tracing of opening.	• Calculate glazing size • Identify glazing material requirements • Template material
3. Discuss use of existing mirror as pattern.	• Fit of existing glass • Calculate glazing size • Identify glazing material requirements
4. Fabricate part for installation.	• Cut glass • Glass finishing/edging

Achievement Criteria:
Given a 10 question quiz on measuring and tracing procedures for template preparation for automotive mirrors the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line I: **TROUBLESHOOTING PROCEDURES**
Competency: **I-1 Explain troubleshooting, power and heated laminated glass**

Learning Objectives:

1. The learner will be able to list the options available for tempered glass.
2. The learner will be able to explain various troubleshooting techniques for low voltage basics and techniques.
3. The learner will be able to describe the tools and equipment used.

LEARNING TASKS	CONTENT
1. List the options available for tempered glass.	• Power windows • Defroster • Future trends
2. Explain low voltage basics and troubleshooting techniques.	• Low voltage for power windows • Low voltage for heated windows • Power supply • 12-volt electrical principles • Sensor reset
3. Describe the tools and equipment used.	• Circuit test light • Ohm meter • Solder gun • Grid repair kit • Manufacturer's service manual

Achievement Criteria:

Given a 10 question quiz on troubleshooting for low voltage on automotive glass the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

Line I: **TROUBLESHOOTING PROCEDURES**
Competency: **I-2 Explain diagnosing and repairing water leaks**

Learning Objectives:
1. The learner will be able to obtain all pertinent information relating to problem.
2. The learner will be able to explain the procedures for diagnosing repairing water leaks.
3. The learner will be able to discuss material used to repair water leaks.

LEARNING TASKS	CONTENT
1. Obtain all pertinent information relating to problem.	• Determine specific water accumulation point • Perform visual inspection • Identify cause of leak • Advise customer of problem
2. Explain the methods used to detect water leaks.	• Demonstrate various leak repair Methods: – Water – Paper – Chalk – Light – Ultra sonic leak detector – Cabin pressurized – Direct pressure
3. Discuss material used to repair water leaks.	• Sealer • Calking • Weatherstrip

Achievement Criteria:
Given a 10 question quiz on the procedures for diagnosing repairing water leaks the learner will be able to demonstrate knowledge of the trade by correctly answering 7 or more questions.

SECTION 3

AUTOMOTIVE GLASS TECHNICIAN TRAINING PROVIDER STANDARDS

TOOLS AND EQUIPMENT

Standard Tools

steel toed boots
respirator
WHMIS
coveralls
banana knife
caulking gun
chisels, punches
air drills
die grinder
door handle clip removal tool
air hammer/chisel
impact driver and bits
gasket locking strip insertion tool
hammers – ball peen/dead blow/rubber
hood/seat covers
impact wrench and impact socket set – SAE and metric
jumper lead
mechanic's pick set
nut driver set – SAE and metric
pry bar
pliers – slip joint, needle nose, adjustable, wheel weight, side cutter, snap ring, locking, hog ring and battery types
screwdriver set
standard test leads and probes
tamper-proof torx set
tape and ruler
upholstery tools – trim panel tools, hog ring pliers
tool box
vise grips
wire stripper/crimping tool
thread pitch gauge
utility knife
safety glasses
ear protection
MSDS
protective gloves
awls
blow gun
centre punch
creeper/fender covers
drill and bits
door panel plug remover tool
air ratchet
drill gauge
flash lights
hacksaw
hex keys – SAE and metric
files – bastard cut/half round/mill cut/square and thread file
inspection mirror
magnetic pick up tool
multimeter (DVOM)
rivet gun
ratchet and sockets – ¼, 3/8 and ½ drive – SAE and metric, swivel, spark plug,extensions and adapters
scraper (gasket and carbon)
soldering tools
steel rule
tap and die set – SAE and metric
test lamp –electronics safe (powered and non-powered)
tin snips – centre, left and right cut
vacuum pump
windshield moulding removal tool
wrench set – SAE and metric/various designs

Shop Tools and Equipment

airbag removal tools
airbag simulators
air compressor – hoses – inline filter and water separators
angle grinder
anti-static devices
arbor press
battery charger/boosting equipment
bench grinders
bench vises
calibrated vessel
dash covers
door glass riveter
drill press
electrical short detector
fender covers
glass table
heat gun
parts washers
ultra-sonic tester
vacuum cleaner
vehicle service information system
water hose

Specialty Tools

cut out knife (cold knife, oscillating, reciprocating)
hand, electric and pneumatic applicator for urethane
extractor
2-part urethane applicator gun (info only),
calking gun(cradle or barrel)
piano wire
pneumatic Feine™ cutaway knife
misc. specialty tools i.e. wiper arm puller,
rear view mirror tools, trim tools.
jig saw
hot knife
extractor
equalizer
cut out knife (cold knife)

INSTRUCTOR REQUIREMENTS

Trade Qualification

- Automotive Glass Technician with a British Columbia Certificate of Qualification endorsement

Work Experience

- Must have a minimum of 5 years experience as an Auto Glass journeyperson.
- Must have diverse Auto Glass industry experience including that which would cover all the competencies in this level.
- Must have recent Auto Glass trade experience.

Training Qualifications

- Instructors Certificate (minimum 30hr course)
- Instructors must have or be registered in an Instructor's Diploma Program, to be completed within a five year period.
- Or, hold a Bachelors or Masters degree in Education.

FACILITY REQUIREMENTS

CLASSROOM AREA

- Comfortable seating and tables suitable for training, teaching, lecturing
- Compliance with all local and national fire code and occupational safety requirements
- Lighting controls to allow easy visibility of projection screen while also allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/air conditioning for comfort all year round
- In-room temperature regulation to ensure comfortable room temperature
- In-room ventilation sufficient to control training room temperature
- Acoustics in the room must allow audibility of the instructor
- White marking board with pens and eraser (optional: flipchart in similar size)
- Projection screen or projection area at front of classroom
- Overhead projector and/or multi-media projector

SHOP AREA (fixed properties)

- Ceiling shall be a minimum height of 16’ or as varied by good engineering practices and code
- Appropriate lifting devises (hoists) used in industry
- Suitable demonstration area
- Lighting appropriate for good vision in ambient light
- Compliance with all local and national fire code and occupational safety requirements
- Must meet Municipal and Provincial bylaws in regards to waste water management and environmental laws

SUGGESTED TEXTS

Auto Glass Technician Reference Manual- National Glass Association
Vancouver Community College Resource Material
NAGS

ADDITIONAL TEXTS

Automotive Technology-Erjavec 4th Edition, (page 568 Photo Sequence Grid Wire Repair) Thompson/Delmar
Burco Redi® Cuts. Catalogue